TUCHINA, V.S., kand.geograficheskikh nauk

World frieght traffic and prospects for its expansion. Trudy TSNIIMF 7 no.37:19-42 '61. (MIRA 15:3)
(Shipping)

TUCHINA, V.S.; CHUPSHEVA, L.G.; SHIROKOV, S.I., red.; LAZAREVA, L.I., red.izd-va; USANOVA, N.B., tekhn. red.
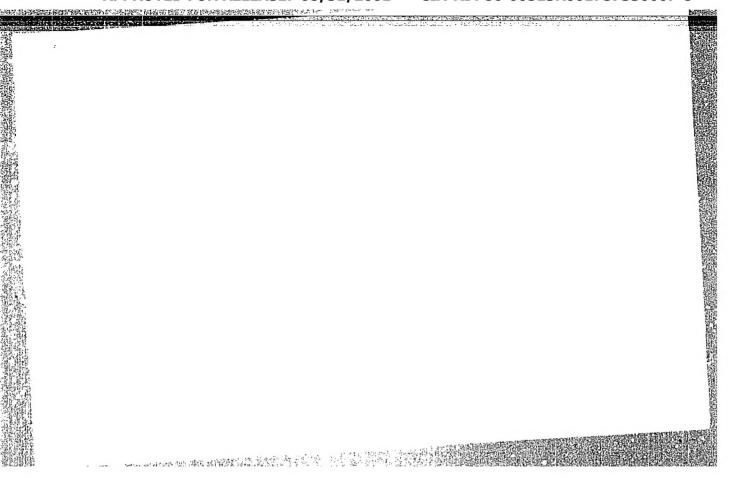
[Merchant marine and freight indices]Torgovoe sudokhodstvo i frakhtovye indeksy. Moskva, Izd-vo "Morskoi transport," 1962. 221 p. (MIRA 16:4)

1. TSentral'nyy nauchno-issledovatel'skiy institut morskogo flota (for Tuchina). 2. Gosudarstvennyy proyektno-konstruktorskiy i nauchno-issledovatel'skiy institut morskogo transporta (for Chupsheva).
(Merchant marine--Statistics)
(Index numbers (Economics))
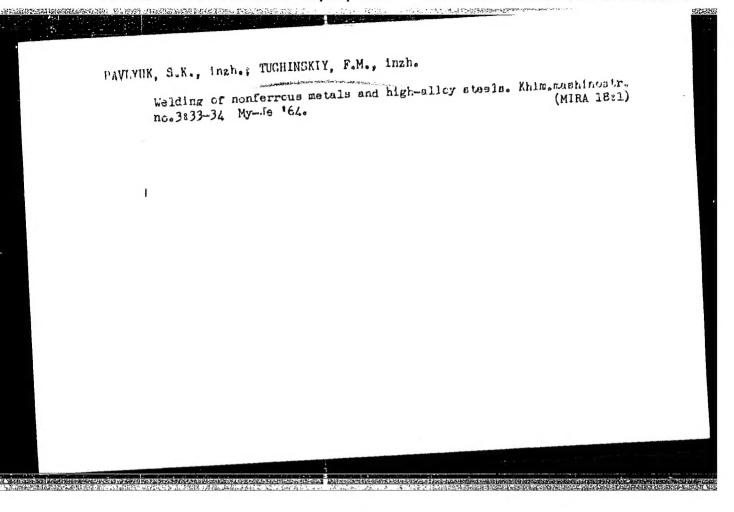
TUCHINA, V.S., kand. geogr. nauk

Development of freight rates under the present conditions
of the capitalist freight market. Trudy TSNIIMF no.65:
34-42 '65.   (MIRA 18:12)

PAVLYUK, S.K., inzh.; TUCHINSKIY, F.M., inzh.

Welding of nonferrous metals and high-alloy steels. Khim.mashinostr.
no.3:33-34 My-Je '64.
(MIRA 18:1)

TUCHINSKIY, F.M., inzh.; SEMERNYA, I.A., inzh.
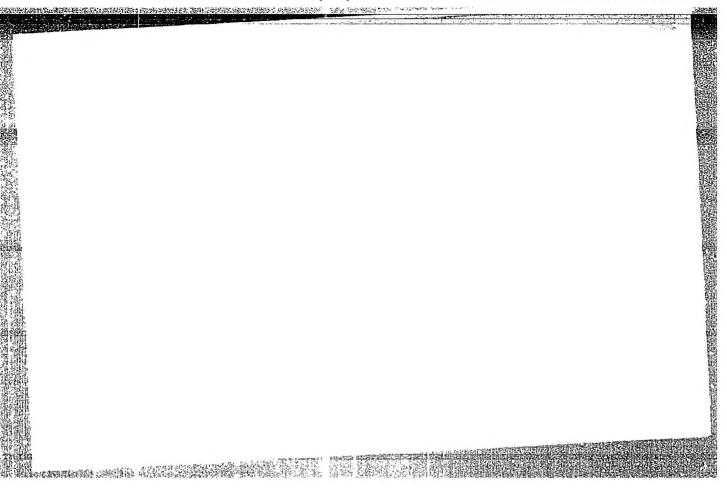
Nozzle for the welding head of the UDAR-300-I unit. Svar.proizv.
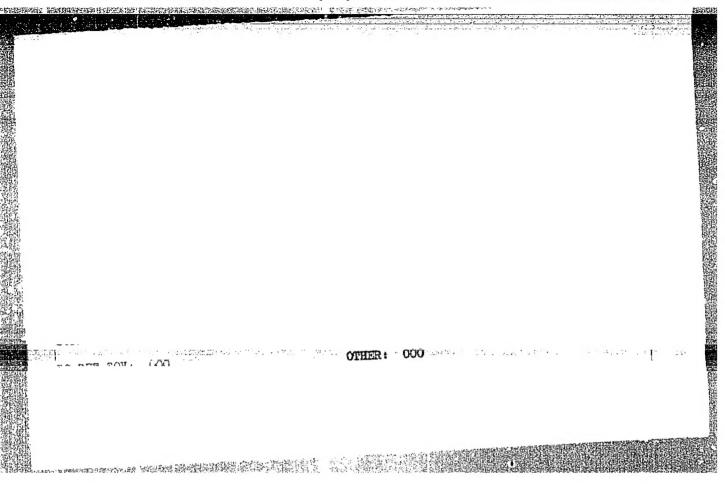no.4:39 Ap '64.   (MIRA 18:4)

1. Berdichevskiy zavod khimicheskogo mashinostroyeniya "Progress".

OTHER: 000

PAVLYUK, S.K., inzh.; TUCHINSKIY, F.M., inzh.

Welding of chemical apparatus made from titanium. Khim. mashinostr. no.1:32-34 Ja'63   (MIRA 16:7)

S/0184/64/000/003/0033/0034

ACCESSION NR: AP4039581

AUTHORS: Pavlyuk, S. K. (Engineer); Tuchinskiy, F. M. (Engineer)

TITLE: Welding of nonferrous metals and high alloy steels

SOURCE: Khimicheskoye mashinostroyeniye, no. 3, 1964, 33-34

TOPIC TAGS: steel welding, steel 1Kh18N9T, steel Kh18N12M2T, steel Kh18N12M3T, steel Kh23N18, steel OKh23N28M3D3T, steel Okh13, titanium, nickel, nickel NP 2, copper, high alloy steel, chromium nickel steel, argon arc welding, gas welding, flux welding, welder UDAR 300, solder NP 2, solder NMts 2.5, alloy VT 1, steel St, 3, ceramic flux ZhN 1, ceramic flux ZhN 2, electrode Progress 50, electrode Komsomolets 100, brass L62, electrode wire Sv 25Kh25N16G7, alloy TsL 8, filler Sv 05Kh19N9F3S2, filler Sv 04Kh19N9, filler Sv 07Kh25N13, semiautomatic welder, welder A 547, welder A 537, flux AN T1, flux AN T3, flux K 8, flux AN 26

ABSTRACT: A short review of different welding techniques applied to nonferrous metals and high-alloy steel is presented by the engineers of the plant "Progress" which specializes in the production of machinery and equipment for chemical plants. The methods used in this plant were grouped as follows: 1) manual arc welding with fusible or infusible electrodes under different protective gases;

Card 1/3

ACCESSION NR: AP4039581

2) automatic and semiautomatic welding with different flux types and filler metals. Infusible tungsten electrodes were used in the manual argon arc welding of high-alloy steel to thin sheets of titanium, nickel, and copper. The same technique was applied to the welding of steels OKh23N28M3D3T and St. 3 if metal thickness did not exceed 4 mm. The composition of filler metals was selected to be as close as was possible to that of the welded alloys, with the exception of nickel NP-2 (which showed best results with the use of NMts-2.5 wire), and of aluminum details. Welding of the latter required special devices such as the UDAR-300 machine. In manual arc welding, the electrodes "Progress-50" were used on nickel NP-2, and the electrodes "Komsomolets-100" on the welds of steel St. 3 to brass L62. The electrodes made of wire Sv-25Kh25N16G7 coated with the TsL-8 alloy were used in welding steels St. 3 to Kh23N18. Greater economy was achieved with the arc welding under carbon dioxide with fusible electrodes and with the Sv-05Kh19N9F3S2 wire used as a filler. These welds were made with the semiautomatic welders A-547 and A-537. The latter method was applied mainly to the chromium nickel steel 1Kh18N9T. Nickel alloy NP-2 was welded to different metals semiautomatically under the ceramic flux ZhN-1 or ZhN-2 with filler metals NP-2 and Sv 04Kh19N9. Machine parts made of titanium alloy VT-1 were welded semiautomatically under the flux AN-T1 or AN-T3 with a degassed filler (hydrogen content below 0.004%). The combinations of flux K-8 and filler Sv-04Kh19N9 or flux AN-26 and filler

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ACCESSION NR: AP4039581

Sv-05Kh19N9F3S2 were used in the joints of steel 1Kh18N9T or of a two-layer steel St. 3 + 1Kh18N9T. The best results were obtained in welding of acid-resistant metals with flux AN 26 and with Sv-07Kh25N13 filler. The men who developed these techniques for nickel and titanium welding at the plant "Progress" were rewarded with a VDNKh medal. Orig. art. has: 2 tables and 2 photographs.

ASSOCIATION: none

SUBMITTED: 00   DATE ACQ: 19Jun64   ENCL: 00

SUB CODE: MM   NO REF SOV: 000.   OTHER: 000

Card   3/3

PAVLYUK, S.K., inzh.; TUCHINSKIY, F.M., inzh.

Some characteristics of the design and manufacture of chemical
apparatus of titanium. Mashinostroenie no.1:45-48 Ja-F '63.
(MIRA 16:7)

1. Kiyevskiy ordena Lenina politekhnicheskiy institut (for
Pavlyuk). 2. Berdichevskiy mashinostroitel'nyy zavod "Progress"
(for Tuchinskiy).
          (Titanium)   (Chemical apparatus)

TUCHINSKIY, G. K.

"On avalanche classification."

report to be presented at Intl Symp on Scientific Aspects of Snow and Ice
Avalanches, Davos, Switzerland, 5 Apr-11 Apr 65.

TUCHINSKIY, L.I.

TIMAN, A.F.; TUCHINSKIY, L.I.

Approximation of differentible functions given on a finite segment
by algebraic polynomials. Dokl.AN SSSR 111 no.4:771-772 D '56.
(MLRA 10:2)

1. Predstavleno akademikom A.N.Kolmogorovym.
   (Functions, Analytic)   (Polynomials)

TUCHINSKIY, L.I.

SUBJECT: USSR/MATHEMATICS/Theory of approximations   CARD 1/1   PG-638
AUTHOR   TIMAN A.F., TUCINSKI L.I.
TITLE   Approximation by aid of algebraic polynomials, of differentiable
              functions which are given on a finite interval.
PERIODICAL   Doklady Akad. Nauk $\underline{111}$, 771-772 (1956)
              reviewed 3/1957

Let the functions $f(x)$ be defined on $[-1,+1]$ and possess there the r-th
derivative $f^{(r)}(x)$ $(r \geq 0)$ which satisfies the Lipschitz condition

$$\left| f^{(r)}(x_1) - f^{(r)}(x_2) \right| \leq M \left| x_1 - x_2 \right|^\alpha \quad (0 \leq \alpha < 1). \text{ Let } \hat{T}_0(x) = \sqrt{\frac{1}{\pi}}, \ \hat{T}_k(x) = \sqrt{\frac{2}{\pi}} \cos k \arccos x,$$

$$k = 1, 2, \ldots \text{ and } c_k = \int_{-1}^{+1} \frac{f(t)\hat{T}_k(t)}{\sqrt{1-t^2}} dt. \text{ Let } S_n(f,x) = \sum_{k=0}^{n} c_k \hat{T}_k(x) \text{ be the partial}$$

sum of the corresponding Fourier-Cebysev series. The authors prove the following
theorem: For $n \rightarrow \infty$ uniformly with respect to all $x \in [-1,+1]$ the asymptotic
equation

$$\sup_{\text{over all } f} \left| f(x) - S_n(f,x) \right| = \frac{2^{\alpha+1} M}{\pi^2} \frac{\ln n}{n^{r+\alpha}} (\sqrt{1-x^2})^{r+\alpha} \int_0^{\frac{\pi}{2}} t^\alpha \sin t \, dt + O\left(\frac{1}{n^{r+\alpha}}\right) \quad (r+\alpha > 0)$$

is valid.

BLINNIK, Lazar' Borisovich; KOZLOV, Vladimir Vasil'yevich; TUCHINSKIY,
Naum Vladimirovich; RAGAZINA, M.F., inzh., ved. red.; SAMOKHOTSKIY,
A.I., inzh., red.; SOROKINA, T.M., tekhn. red.

[Efficient conditions for the aging of cast iron]Ratsional'nye re-
zhimy stareniia chugunnykh otlivok. Moskva, Filial Vses. in-ta
nauchn.i tekhn. informatsii, 1958. 12 p. (Peredovoi nauchno-
tekhnicheskii i proizvodstvennyy opyt. Tema 3. No.M-58-112/5)
                                                  (MIRA 16:2)

            (Cast iorn—Hardening)

TUCHINSKIY, N.V., inzh.

Fine planing of printing machinery parts. Vest.mashinostr.
42 no.7:71-73 Jl '62.   (MIRA 15:8)
                              (Metal cutting)

ZERNYAKOV, Boris Stepanovich; TREBELEV, Aron Markovich; BURLAKOV, Vla-
    dimir Yevgen'yevich; POLIVANOV, Vasiliy Fedorovich; MANZON,
    Eduard Abramovich; DUNAYEV, Yuriy Andreyevich; UDAL'TSOV, A.N.,
    glavnyy red.; MALOV, A.N., kand.tekhn.nauk, red.; TUCHINSKIY,
    N.V., inzh., red.; ZASLAVSKIY, M.L., inzh., red.; SMIRNOV, P.V.,
    inzh., red.; NEUSYPIN, A.M., inzh., red.

[New method of preparing aluminum alloys in electric furnaces;
Efforts to avoid losses in brass smelting; Use of rolled metal
with variable cross section for the manufacture of truck trailer
axles; New design of rotor blades for low capacity hydraulic
turbines; Lubricant collection in settling basins] Novyi sposob
prigotovleniia aliuminievykh splavov v elektricheskikh pechakh;
Bor'ba s poteriami pri plavke latuni; Primenenie prokata peremennogo
secheniia dlia izgotovleniia osei avtopritsepa; Novaia konstruktsiia
lopastei rabochikh koles gidroturbin maloi moshchnosti; Sbor masla v
otstoinikakh. Moskva, 1956. 12 p. (Peredovoi proizvodstvenno-
tekhnicheskii opyt. Ser.19. Ekonomiia materialov i novye materialy,
primeniaemye v mashinostroenii. No.T-56-363/6).   (MIRA 13:3)

1. Akademiya nauk SSSR. Institut nauchnoy i tekhnicheskoy in-
formatsii.
                (Technological innovations)

TUCHINSKIY, N.V.

TSYPIN, Izrail' Osipovich, kand.tekhn.nauk; OKUNEVA, A.I., inzh., vedushchiy
red.; TUCHINSKIY, N.V., inzh, red.; SIMAKOV, A.T.,tekhn.red.

[Alloyed antifriction magnesium iron] Legirovannyi antifriktsionnyi
magnievyi chugun. Moskva, Filial Vses.in-ta nauchnoi i tekhn.
inform., 1956. 8 p. (Informatsiia o nauchno-issledovatel'skikh
rabotakh. Tema 2, no.I-56-223)   (MIRA 10:12)
                    (Iron-magnesium alloys)

/ L (IL.H.-.H I I , A. L

SHAPIRO, Zal'man Berkovich, inzh.; OKUNEVA, A.I., inzh., vedushchiy red.;
    TUCHINSKIY, N.V., inzh., red.; SOROKINA, T.M., tekhn.red.

[Casting iron reinforcements in permanent molds] Lit'e chugunnoi
armatury v postoiannye formy. Moskva, Filial Vses.in-ta nauchnoi
i tekhn.inform., 1956. 9 p. (Informatsiia o nauchno-issledovatel'skikh
rabotakh. Tema 2, no.I-56-218)   (MIRA 10:12)
                    (Die casting)

TUCHINSKIY, Naum Vladimirovich; LAVROV, Gleb Aleksandrovich; ZAYTSEV,
       Nikolay Petrovich; KARATYGIN, A.M., dotsent, kand.tekhn.nauk,
       retsenzent; VOSKRESENSKIY, N.N., inzh., red.; TAIROVA, A.L.,
       red.izd-va; CHERNOVA, Z.I., tekhn.red.

       [Technology of printing-machinery manufacture] Tekhnologiia
       poligraficheskogo mashinostroeniia. Moskva, Gos.nauchno-tekhn.
       izd-vo mashinostroit.lit-ry, 1960.   376 p.   (MIRA 13:7)
              (Printing machinery and supplies)

(State Committee for Aviation _____)

TUCHKEVICH

*Pouring of Aluminium into Rotors in Short-Circuited Electric Motors in a Rotating Magnetic Field. N. M. Tuchkevitch and V. S. Rutes (*Vestnik Elektropromishlennosti (Messenger Elect. Ind.), 1936, (3), 6-10).—[In Russian.] The metal is poured as rapidly as possible at 740° C., into a mould of non-magnetic steel or cast iron and is subjected during casting to a rotating (950 r.p.m.) magnetic field created by the stator, the inner surface of which is coated with asbestos. The method ensures more rapid and compact filling of the mould, a reduction in the number of subsequent operations, and improved electro-magnetic properties of the rotor.—N. A.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

TUCHKEVICH N. M.

13

Casting of Lead Bronze Bearings in a Revolving Magnetic Field. N. M. Tuchkevich and V. N. Rutes (*Tekhnika Vozdushnogo Flota* (*Tech. Aerial Navy*), 1936, (4), 62-72; and *Vestnick ElektropromishlenosƟi* (*Messenger Elect. Ind.*), 1936, (3), 6-10). --[In Russian.] In filling the bearing casings with lead-bronze, it is more convenient to use, instead of the stator of the motor, a specially constructed anchor type stator ; cased in the centre of a graphite plug and to create a magnetic field inside the assembly. N. A.

TUCHKEVICH, N. M.

Steel Castings

Thin-walled steel casting. Lit. proizv., no. 2, 1952.

TUCHKEVICH, N.M.

USSR/Miscellaneous – Foundry processes

Card   1/1   :   Pub. 61 – 4/23

Authors   :   Tuchkevich, N. M.

Title   :   Effect of casting technology on the strength of steel cast objects

Periodical   :   Lit. proizv. 3, 9-12, May-June 1954

Abstract   :   An investigation was conducted to determine the effect of technological casting and casting defects on the static strength of mold-casted steel products. The results of static tests of numerous thin-walled castings are shown in a table. Tables; drawings; illustration.

  Institution :   ...

  Submitted   :   ...

KUZMAK, Ye.M.; KURDIN, A.I.; TUCHKEVICH, N.M.

Using hard alloys for three-dimensional reinforcement of bit
milling cutters. Neft.khoz. 35 no.1:31-35 Ja '57.   (MLRA 10:2)

(Cutting tools)

ACC NR: AP7003870   (N)

AUTHOR: Fomicheva, N. P.; Klyuyev, K. M.; Topilin, V. V.; Tuchkevich, N. M.;
Doronin, V. M.; Dzugutov, M. Ya.; Terekhov, K. I.; Mikhin, T. A.

ORG: none

TITLE: Electroslag remelting of EI481 chromium-manganese-nickel heat resistant steel

SOURCE: Stal', no. 1, 1967, 39-41

TOPIC TAGS: MANGANESE STEEL, NICKEL STEEL, chromium manganese nickel steel, heat resistant steel, steel melting, electroslag melting, steel composition, steel mechanical property/EI481 steel

ABSTRACT:

Cast EI481 high-alloy heat-resistant steel (0.34—0.40% C, 7.5—9.5% Mn,
11.5—13.5% E, 7.0—9.0% Ni, 1.1—1.4% Mo, 0.25—0.45% Nb, 1.3—1.6% V,
0.3—0.8% Si) was electroslag remelted under four different slags and tested
for chemical composition, nonmetallic inclusions and mechanical properties.
The best results were obtained with the use of standard or with 10% lime
No. 4 slag of the CaF_2-CaO system. In all cases, electroslag remelting
changed only slightly the steel composition. It decreased the content of
manganese by 0.04—0.20 abs.% and of vanadium by 0.08 abs.%; the sulfur
content decreased by 20—40%, but no substantial decrease was observed in
the hydrogen and oxygen contents. The electroslag remelting also decreased

Card 1/2

UDC: 669.187.26

ACC NR: AP7003870

the content of nonmetallic inclusions from 98.7 to $52.3 \cdot 10^{-4}$% and resulted in more uniform distribution. No significant changes were observed in the mechanical properties of the electroslag remelted metal (all were above the technical requirements) but the anisotropy of the ductility characteristics decreased by 20—40%. In stress-rupture tests at 650C under a stress of 38 kg/mm^2, the steel remelted under No. 4 slag failed after 156 hr compared with 35 hr required for conventionally melted steel. Forged parts from electroslag remelted steel had a tensile strength of 112.0—104.0 kg/mm^2, a yield strength of 74.0—83.7 kg/mm^2, an elongation of 19.2—24.0%, a reduction of area of 31.2—43.9% and an impact toughness of 4.5—5.5 kg·m/cm^2. The corresponding figures for forgings of conventionally melted EI481 steel were 60 and 85 kg/mm^2, 15 and 20%, and 2.5 kg·m/cm^2. The electroslag remelting of EI481 steel can be recommended for increasing the service life of parts made from this steel. Orig. art. has: 2 tables.

[MS]

SUB CODE: 11/ SUBM DATE: none/ ORIG REF: 002/ ATD PRESS: 5115

Card 2/2

IRININ, A.M.; GRECHIN, V.P.; TUCHKEVICH, N.M.

Effect of the rate of metal flow during vacuum arc refining
on the properties of heat-resistant alloys. Stal' 23
no.2:133-135 F '63.   (MIRA 16:2)
        (Heat-resistant alloys—Electrometallurgy)
                 (Vacuum metallurgy)

TUCHKEVICH, N.M.; KOLOBASHKIN, B.M.

Making castings from a skin-sensitive alloy by centrifugal methods
in vacuum and in a gas-shielded atmosphere. Lit.proizv. no.2:12-14
F '62.   (MIRA 15:2)
(Centrifugal casting)   (Protective atmospheres)

AUTHORS: Tushkevich, N.M.; Kolobashkin, B.M.

TITLE: Producing castings from scab-sensitive alloys by the vacuum method
             and with gas shielding

PERIODICAL: Liteynoye proizvodstvo, ro. 2, 1962, 12 - 14

TEXT: Although scab formation is practically absent in the centrifugal
casting of heat-resistant alloys containing Cr, Al, Ti, etc., a great number of
publications on vacuum casting and gas-shielded casting reveal that also in cen-
trifugal casting a certain protection of the metal from oxidation is rather use-
ful. The authors report on investigations carried out by V.N. Bukhteyev, Ye.G.
Moskaleva, Ye.P. Prozorcva and V.A. Zhabina to establish the effect of gas-shield-
ed centrifugal casting to protect the metal from oxidation on the properties of
scab-sensitive alloys. The centrifugal casting machine with vacuum chamber has
been designed under the supervision of the authors and B.F. Milyayev, while it
was built under the direction of V.L. Khersonskiy. A detailed description of
the machine design and the specimen tests is given. Cast annular specimens were
cut into templets and subjected to tests showing their physical-mechanical pro-

Card 1/3

S/128/62/000/002/002/???
A004/A127

Producing castings from scab-sensitive ....

perties, microstructure, heat resistance, specific gravity, and also for determining their gas content, nonmetallic inclusions and chemical composition as to the basic easily oxidizing metal elements. The test results revealed the positive effect of argon-shielded casting and vacuum casting on the strength, ductility and notch toughness of the alloy. [Abstracter's note: The alloy composition is not given.] Argon somewhat reduced the heat resistance of the metal, which can be explained by the considerable increase in ductility and notch toughness. Casting in a nitrogen medium increased the heat resistance, in comparison with casting in air, by 30 - 40%, while this increase amounted to 15 - 20% if casting was effected in a vacuum. The test results showed, however, that the amount of nonmetallic inclusions is rather insignificant in vacuum or gas-shielded casting. (Y .P. Prozorova determined the amount of nonmetallic inclusions in the alloy, while the gas content was determined by the hot-extraction method and the nitrogen content by the chemical method under the supervision of V.A. Zhakina.) The results showed that the use of a vacuum or gas shield, particularly argon, improved the metal purity during centrifugal casting of scab-sensitive alloys on nickel base and increased the heat resistance owing to the reduction in the gas content and nonmetallic inclusions. There are 6 figures and 12 references.

Card 2/3

Producing castings from scab-sensitive S/128/62/000/002/003/007
                                                      A004/A127

ences: 8 Soviet-bloc and 4 non-Soviet-bloc. The three references to English
language publications read as follows: Czorniak, E.S., "Precision Metal Mold
ing", v.15, no. 10, 1957; "Metal Industry", v. 92, no. 4, 1958; "Metal Pro
gress", v. 73, no. 5, 1958.

Card 3/3

ALEKSANDROV, R.G.; BARBASHINA, Ye.G.; BAS'KO, K.P.; VARTAN'YAN, A.S.; VASILEV-
SKIY, P.F.; GLAGOLEVA, L.A.; DUBININ, N.P., prof., doktor tekhn. nauk;
KONSTANTINOV, L.S.; KOROTKOV, A.I.; LESNICHENKO, V.L.; PANFILOV, Ye.A.;
TRUBITSYN, N.A.; TUCHKEVICH, N.M.; FADEYEV, A.D.; FOKIN, G.F.; MARTENS,
S.L., inzh., red.; SOKOLOVA, T.F., tekhn. red.

[Steel casting; foundrymen's handbook] Stal'noe lit'e; spravochnik
dlia masterov liteinogo proizvodstva. Moskva, Gos. nauchno-tekhn. izd-
vo mashinostroit. lit-ry, 1961. 887 p.   (MIRA 14:8)
                                (Founding)

TUCHKEVICH, N.M.; PETROVA, V.S.

Cast specimens for the control of mechanical properties in
precision casting. Lit. proizv. no.9:20-22 S '58. (MIRA 11:10)
        (Precision casting)   (Founding--Testing)

AUTHORS: Tuchkevich, N.M., Petrova, V.S.   SOV-128-58-9-8/16

TITLE: Cast Specimens for the Control of the Mechanical Properties
             of Precision Casting (Lityye obraztsy dlya kontrolya mekha-
             nicheskikh svoystv tochnogo lit'ya)

PERIODICAL: Liteynoye proizvodstvo, 1958, Nr 9, pp 20-22 (USSR)

ABSTRACT: The quality of cast material is tested by cutting out samples
             which are then subjected to the different tests. In the
             article, a method is investigated by which special samples
             are cast together with the other molds. These samples are
             tested. They show the same results only if the metal has
             the same density as the molds. In Figure 1, the forms of
             the samples are given: type a is used for testing blow vis-
             cosity, type b for testing breaking-resistance at high tem-
             peratures, type c for other breaking tests. The material
             used was stainless steel type Kh17N4, and the highly-re-
             sistant structural steel type 35KhGSL. The specimens were
             tested in vertical and horizontal positions (Figure 3). The
             results are given in Table 3. The results for cut-out and
             cast samples are nearly the same. Table 4 shows the results
Card 1/2   of the mechanical tests for steel type 35KhGSL. The differ-

SOV-128-58-9-8/16

Cast Specimens for the Control of the Mechanical Properties of Precision Casting

ence in the plastic properties measured is explained by insufficient processing.
There are 4 tables, 2 sets of diagrams, 1 photo, and 4 Soviet references.

1. Metals--Casting   2. Metal castings--Test methods   3. Metal castings--Quality control

Card 2/2

TUCHKEVICH, T.M., kand. ekon. nauk, dots.

Calculating average efficiency in railroad transportation. Trudy
KHIIT no.27:3-12 '58.   (MIRA 11:6)
                        (Railroad—Management)

ANGELEYKO, V.I., doktor tekhn. nauk, prof.; TUCHKEVICH, T.M., kand. ekon. nauk, dots.; NAUMOV, G.K., kand. ekon. nauk, dots.

Improvements in planning and business accounting on track divisions. Trudy KHIIT no.27:29-44 '58.   (MIRA 11:6)
                          (Railroad--Management)

TUCHKEVICH, T.M., kand. ekonom. nauk (Khar'kov)

Measurement of the labor productivity of the workers of railroads
and of their subdivisions. Zhel. dor. transp. 46 no.8:59-61 Ag '64.
(MIRA 17:11)

ORLOV, V.N., prof; SILAYEV, N.I., kand.ekon.nauk; KRIMNUS, G.Kh., kand.ekon.
nauk; NAUMOV, G.K., kand.ekon.nauk; TUCHKEVICH, T.M., kand.ekon.nauk;
KARASIK, V.Ya., kand.tekhn.nauk; GORDON, Ye.G., starshiy prepodavatel'
(Khar'kov).

"Transportation economics" by T.S.Khachaturov. Reviewed by V.N.Orlov
and others. Zhel.dor.transp. 42 no.10:91-95 O '60.   (MIRA 13:10)
            (Railroads--Freight)   (Transportation)
                        (Khachaturov, T.S.)

NAUMOV, G.K., kand.ekon.nauk; SILAYEV, N.I., kand.ekon.nauk; TUCHKEVICH,
T.M., kand.ekon.nauk; KRIMNUS, G.Kh., kand.ekon.nauk; YELISEYEVA,
T.V., inzh. (Khar'kov)

Necessary textbooks for the teaching of economics to personnel.
Zhel. dor. transp. 40 no.6:91-94 Je '58.   (MIRA 11:6)
        (Railroads--Finance)

TUCHKEVICH, T.M., dotsent, kandidat ekonomicheskikh nauk.

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no.24:5-18 '54.   (MLRA 8:1)
        (Locomotives--Repairs)

TUCHKEVICH, T.M., kandidat ekonomicheskikh nauk (Khar'kov); ADAMENKO, N.V., kandidat ekonomicheskikh nauk, inzhener (Khar'kov); KRIMNUS, G.Kh., inzhener (Khar'kov); LEMBERSKIY, A.Ya., (Khar'kov); NAUMOV, G.K., kandidat ekonomicheskikh nauk (Khar'kov); SILAYEV, N.I., kandidat ekonomicheskikh nauk, dotsent (Khar'kov); USHAKOV, P.S., (Khar'kov); EDEL'SHTEYN-UDYANSKIY, P.G.; kandidat ekonomicheskikh nauk (Khar'kov).

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(MLRA 9:10)

(Railroads--Management)

TUCHKEVICH, T.M.

NAUMOV, G.K., kandidat ekonomicheskikh nauk (Khar'kov); SILAYEV, N.I.,
kandidat ekonomicheskikh nauk (Khar'kov); TUCHKEVICH, T.M.,
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inzhener (Khar'kov); KRIMHUS, G.Kh., inzhener (Khar'kov).

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    retsenzent [deceased]; PESKOVA, L.N., red.; BOBROVA, Ye.N., tekhn.
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    nost' truda na zheleznodorozhnom transporte. Moskva, Vses.
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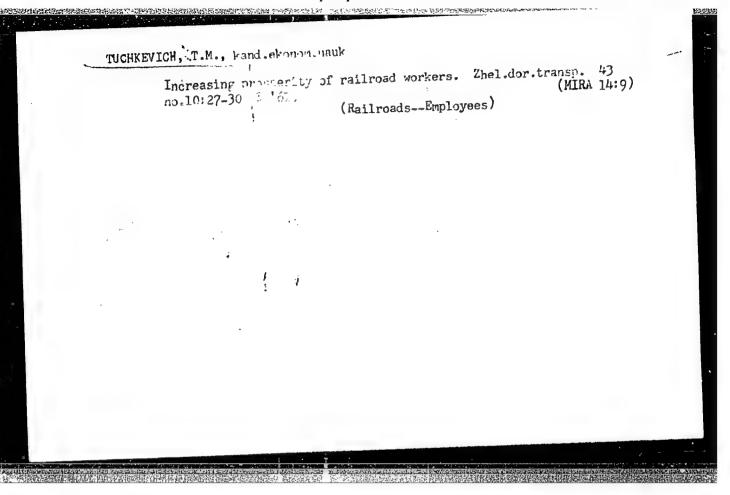   259 p.   (MIRA 14:5)
            (Railroads--Labor productivity)

IVLIYEV, I.V.; PETRUKHNOVSKIY, I.V. retsenzent ; KRIMNUS, G.Kh.
    retsenzent ; NAUMOV, G.I. retsenzent ; ORLOV, V.N.
    retsenzent ; TUCHKEVICH, T.M. retsenzent ; USHAKOV,P.S.
    retsenzent ; CHERNUKHA, N.T. retsenzent ; EDEL'SHTEYN,
P.G. retsenzent ; KRISHTAL', L.I., red.; VINNICHENKO, N.G.,
kand. ekon. nauk, red.; USENKO, L.A., tekhn.red.

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ANGELEYKO, Viktor Ivanovich; NAUMOV, Georgiy Karpovich; TUCHKEVICH,
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tekhn.red.

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Organizatsiia i planirovanie truda v putevom khoziaistve.
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TUCHKEVICH, T.M., kand.ekonom.nauk

    Increasing prosperity of railroad workers. Zhel.dor.transp. 43
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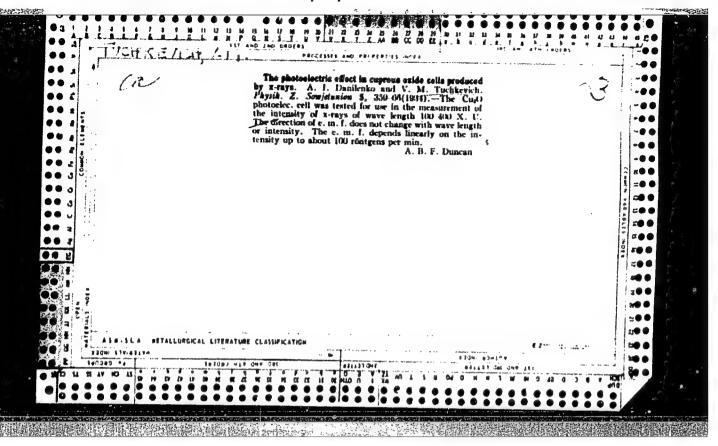   (Railroads--Employees)

KON'KOV, P.S., , kand. tekhn.nauk, dots.; DONTSOV, A.Ya., inzh.;
        YURCHENKO, I.F., inzh.; ANGELEYKO, V.I., retsenzent;
        BABENKO, V.I., retsenzent; ZAPREVSKIY, G.S., retsenzent;
        KRIMNUS, G.Kh., retsenzent; MANIN, I.I., retsenzent;
        NAUMOV, G.K., retsenzent; TOLSTOSHEY, A.N., retsenzent;
        TUCHKEVICH, T.M., retsenzent; FEDORETS, V.M., retsenzent;
        FEL'DMAN, M.F., retsenzent; FRANKOV, N.Ya., retsenzent;
        USENKO, L.A., tekhn. red.

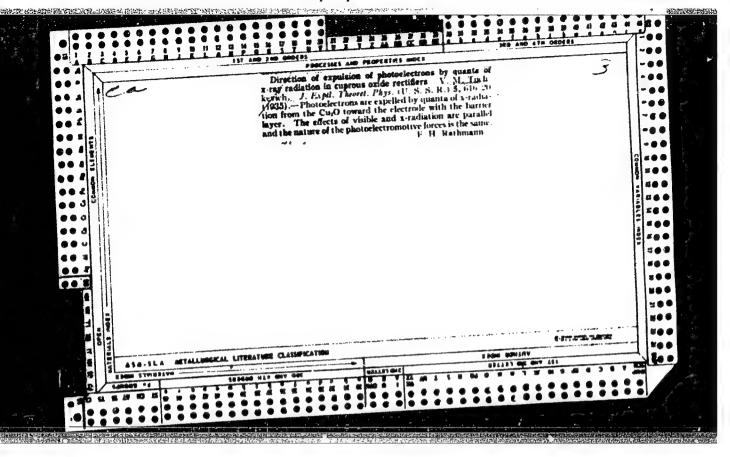   [Establishing work norms in railroad transportation] Tekh-
        nicheskoe normirovanie truda na zheleznodorozhnom transporte.
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PROCESSES AND PROPERTIES NOTES

The photoelectric effect in cuprous oxide cells produced by x-rays. A. I. Danilenko and V. M. Tuchkevich. *Physik. Z. Sowjetunion* 5, 350-68(1934).—The Cu_2O photoelec. cell was tested for use in the measurement of the intensity of x-rays of wave length 100-400 X. U. The direction of e. m. f. does not change with wave length or intensity. The e. m. f. depends linearly on the intensity up to about 100 röntgens per min.

A. B. F. Duncan

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

Direction of expulsion of photoelectrons by quanta of x-ray radiation in cuprous oxide rectifiers. V. M. Lush kevich. J. Expt. Theoret. Phys. (U. S. S. R.) 5, 616-20 (1935).—Photoelectrons are expelled by quanta of x-radiation from the Cu₂O toward the electrode with the barrier layer. The effects of visible and x-radiation are parallel and the nature of the photoelectromotive forces is the same.

F. H. Rathmann

PONKRATOV, L.M.

Ca

3

The direction of liberation of photoelectrons by x-ray quanta in the cuprous oxide photocell. V. M. Tuchkevich. *Physik. Z. Sowjetunion* 7, 320-33(1935).—The electrons are given off from the barrier layer of Cu_2O and are never accelerated to the Cu_2O. The direction of illumination does not influence the direction of liberation of electrons either with visible light or with x-rays. The origin of the photoelectromotive force is the same with visible light and with x-rays.
                                                    A. B. F. Duncan

METALLURGICAL LITERATURE CLASSIFICATION

CA
TUCHKEVICH, V.M.

Effect of oxygen concentration in oxidizing and tempering furnaces on the direct and reverse currents of cuprous oxide rectifiers. V. M. Tuchkevich. J. Tech. Phys. (U. S. S. R.) 10, 717-31(1940). Expts. show that the variations of the O content from 20 to 100% in oxidizing, and from 0 to 100% in the tempering furnaces do not essentially affect the values of the direct and reverse currents in the rectifiers obtained.   Roksolana Gamow

TUCHKEVICH, V. M.

(A)

Processes in cuprous oxide rectifiers in an impulse cir cuit. V. M. Tuchkevich. *J. Tech. Phys.* (U. S. S. R.) 10, 1810-20(1940). — A circuit producing current im- pulses of given value and duration was constructed to in- vestigate the equiv. capacity of Cu_2O rectifiers. The capacity for a stopping potential of 11 v. coincides with the potential calcd. by extrapolation of the capacity curve ob- tained for the new circuit. Roksolana Gamow

H

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

TUCHKEVICH, V. M.

Feb 47

USSR/Frequency Measurements
    Impedance - Measurements

"Interpretation of Homogeneous Resistance Measurements for Various Frequencies," V. K. Subashiyev, V. M. Tuchkevich, 18 pp

"Zhur Tekh Fiz" Vol XVII, No 2

Theoretical determination of the complex inpedance, Z. Graphs and tables relating R, C, Z, H and f.

PA11T23

TUCHKEVICH, V.M., redaktor; GESSEN, L.V., redaktor; SHAPOVALOV, V.I.,
tekhnicheskiy redaktor

[Semi-conducting materials; translated from the English] Poluprovodni-
kovye materialy. Per. s angliiskogo. Moskva, Izd-vo inostrannoi lit-
ry, 1954. 370 p.   (MLRA 8:3)
        (Semiconductors)

TUCHKEVICH, V·M·

FD-2398

USSR/Physics - Photodiodes

Card 1/1   Pub. 153-2/21

Author   :   Alferov, Zh. I.; Konovalenko, B. M.; Ryvkin, S. M.; Tuchkevich, V. M.;
and Uvarov, A. I.

Title   :   Flat germanium photodiodes

Periodical :   Zhur. tekh. fiz. 25, 11-17, Jan 1955

Abstract   :   The authors describe the principal properties of germanium photodiodes
of unique design and free from the usual deficiencies. In this design
the illuminated area is not limited by the length of the diffusion dis-
placement and can reach very large sizes corresponding to the total area
of the n-p transition. They conclude: the germanium photodiode is a
photocell valve to which considerable voltages can be applied in the
closed direction; the sensitivity of the photodiode is about 300 times
that of photocells with external photoeffect; the proper time of germani-
um photodiodes studied is about $1/10^5$ second, and can be decreased by
decrease of the thickness of the n-germanium layer; the characteristics
are very stable and free of "fatigue". Deficiencies are considerable
temperature dependence of the dark current. The authors thank D. N.
Nasledov, N. V. Shchetinina, and L. P. Bogomazov. Three references,
including one USSR (S. M. Ryvkin, same issue, p. 21).

Institution: --

Submitted :   October 13, 1954

FD-2399

TUCHKEVICH, V M.
USSR/Physics - Photodiodes

Card 1/1   Pub. 153-3/21

Author   :   Konovalenko, B. M.; Ryvkin, S. M.; and Tuchkevich, V. M.

Title   :   Sensitivity of germanium photodiodes to x-rays

Periodical :   Zhur. tekh. fiz. 25, 18-20, Jan 1955

Abstract   :   Numerous attempts have been made to utilize photocell valves as dosi-
                 meters of x-rays (e.g. V. M. Tuchkevich, Phys. ZS d. Sow. 5, 1934 and 7,
                 1935; I. M. Polyak and M. N. D'yachenko, ZhTF 22, 1952), but without
                 practical results in consequence principally of the insufficient sensi-
                 tivity. Recently a new type has been investigated, namely the germani-
                 um photodiode (same issue, p. 11; see preceding abstract). In the pres-
                 ent article the authors expound certain results of their efforts on this
                 problem; namely, they compare the sensitivity of germanium photodiodes
                 and certain photocell valves under various conditions. They point to
                 the possibility of the practical utilization of n-p transitions in ger-
                 manium as dosimeters of intense x-rays (e.g. direct radiation). They
                 thank D. N. Nasledov and N. I. Dodon.. Six references: e.g. I. Shive,
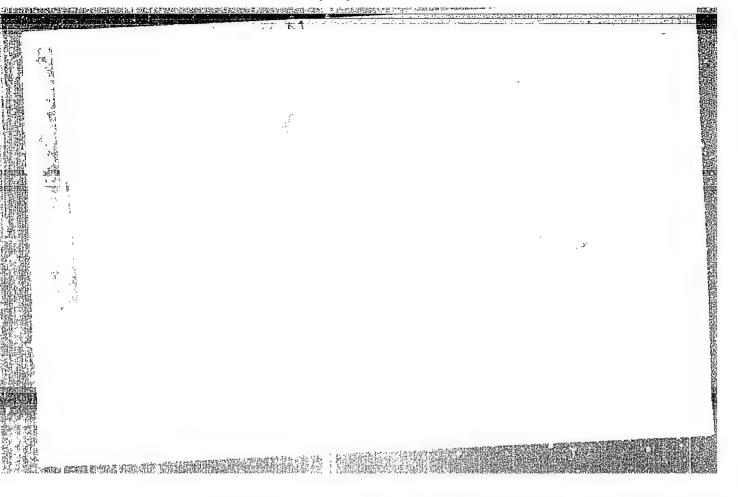   JOSA, 43, 1953.
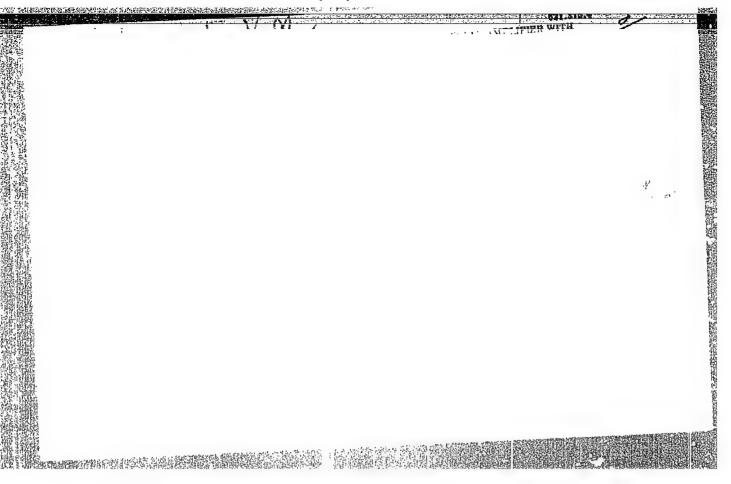
Institution: --

Submitted   :   October 13, 1954

TUCHKEVICH, V.M.

TEPLOVA, A.P.;TUCHKEVICH, V.M.;UVAROV, A.I.

Measurement of the active and reactive components of the input resistance of a crystal amplifier by the method of varying the resistance of a generator. Zhur.tekh.fiz. 25 no.12:2112-2118 O '55.   (MLRA 9:1)
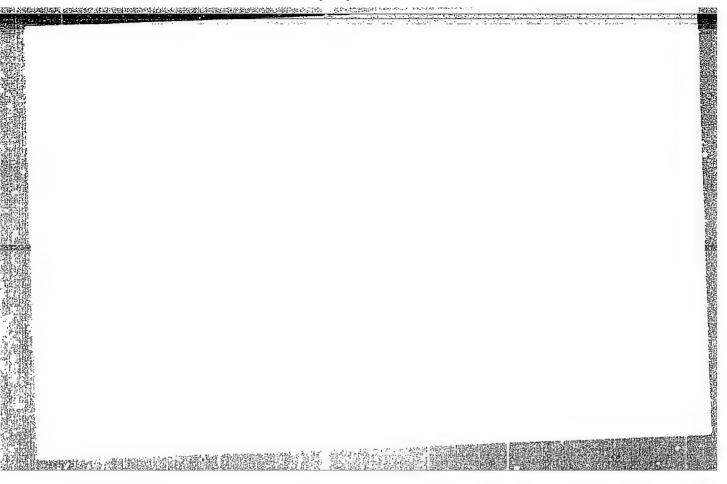
(Transistors) (Electronic measurements)

Tuchkevich, V, M,

537.311.33

5677   INVESTIGATION OF THE RESISTANCE VARIATION OF GERMANIUM IN A MAGNETIC FIELD   V.I.Stafeev and V.M.Tuchkevich.
Zh. Tekh. Fiz. Vol 26. No. 2. 273-6 (1956). In Russian
    The characteristics $\Delta\rho/\rho_0 = f(H)_T$ are power functions with varying exponents This applies to strong and weak fields. The field strength corresponding to a bend in curves on a double-logarithmic scale shifts with higher temperatures to stronger fields, this agreeing with theoretical expectations. The character of the function $\Delta\rho/\rho_0 = f(H)_T$, however, and particularly the variation of the exponent, is in contradiction to theory.   Electrical Research Association

TUCHKEVICH, VM.

SUBJECT   USSR / PHYSICS   ᵥCARD 1 / 2   PA - 1552
AUTHOR   LEBEDEV,A.A., STAFEEV,V.I., TUCKEVIC,V.M.
TITLE   Some Properties of the Diodes consisting of Germanium with a
                   Gold Admixture.
PERIODICAL   Žurn,techn.fis, 26, fasc.10, 2131-2141 (1956)
                   Issued: 11 / 1956

As gold atoms form two acceptor levels which are deep in the forbidden zone, the
properties of germanium may depend in a high degree on the ratio of the concen-
trations of the gold atoms and any donor admixture in the germanium. Let it be
assumed that N_{Au} and N_D denote the concentration of the gold atoms and donor
atoms respectively.

At $N_{Au} > N_D$ the germanium has hole-conductivity (here called germanium of the
I.type), but at $2 N_{Au} > N_D > N_{Au}$ it is electronic and the temperature depen-
dence of the conductivity depends on the distance of the upper acceptor level of
the gold from the bottom of the conductivity zone ($\triangle E = 0,2$ eV). (Here called
germanium of the II. type). However, in the case of $N_D > 2N_{Au}$ all gold levels
are stopped up at all temperatures, and the germanium then has electronic conduc-
tivity. (Here called germanium of the III. type). The admixture of gold exer-
cises hardly any influence at all on the temperature dependence of conductivity.
The diodes produced from germanium of the I. II. and III. types are here described
as diodes of the I.II. and III. groups. The properties of Ge III are not deter-

Žurn.techn.fis,<u>26</u>, fasc.10, 2131-2141 (1956) CARD 2 / 2   PA - 1552

mined by the admixture of gold but only by the donor admixture, and they offer
nothing new. Therefore only the diodes of groups I and II are investigated here.
<u>The temperature dependence of direct amperage in the diodes.</u> At first the
oscillograms of the diodes of the first group, made at room temperature and at
higher temperatures, are given and discussed. After a certain (critical) voltage
has been attained, the voltage on the diode declines sharply. If amperage is
further increased, voltage remains constant. The discontinuity of the characte-
ristic (breakdown) is most noticeable in the diodes of the II. group. The volt-
ampére characteristics of this group deviates already below -50° C from the
characteristic of the usual diodes. At still lower temperatures breakdown takes
place. In the case of the diodes of the II. group the disruptive voltage grows
rapidly within the range of from -160° to -200° C. The probable causes of these
phenomena are discussed. The breakdown characteristic, by the way, depends on
the intensity of illumination and on the field strength of a magnetic field
which may possibly exercise its influence.

INSTITUTION: LFTI (= Leningrad Physical-Technical Institute) Leningrad.
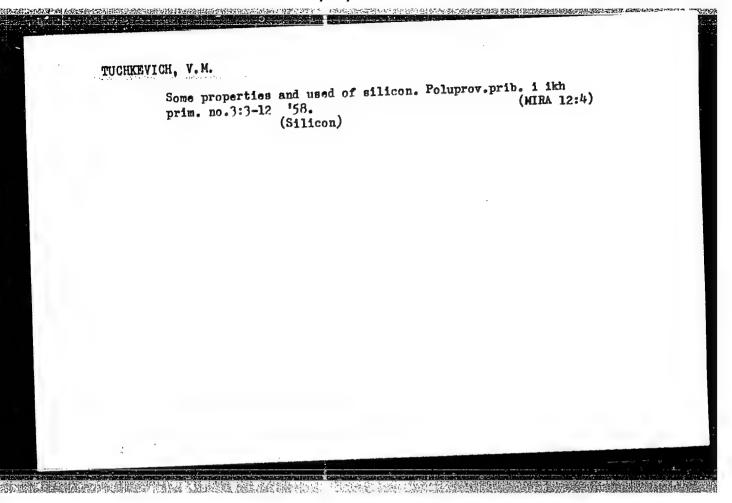
TUCHKEVICH, V. M. (Dr. Phys. Maths. Sci.)

"The Need for Introducing Semi-conducting Apparatus, Taking into Account Their Specific Properties and the Working Conditions of the Automatic Devices,"

paper read at the Session of the Acad. Sci. USSR, on Scientific Problems of Automatic Production, 15-20 October 1956.
Avtomatika i telemekhanika, No. 2, p. 182-192, 1957.

9015229

TUCHKEVICH, V.M.

Some properties and used of silicon. Poluprov.prib. i ikh
prim. no.3:3-12 '58.   (MIRA 12:4)
                    (Silicon)

SOV/57-58-8-3/37

AUTHORS: Stafeyev, V. I., Tuchkevich, V. M.

TITLE: Dependence of the Hall Constant Upon Temperature and Magnetic Field Strength in p-Type Germanium (Zavisimost' postoyannoy Kholla ot temperatury i napryazhennosti magnitnogo polya v germanii p-tipa)

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1958, Nr 8, pp 1642-1645 (USSR)

ABSTRACT: This is an investigation of the function of the Hall-(Kholl) constant versus H and T. The same samples of hole-conducting germanium were used as in reference 4. Data concerning these samples are therefore omitted. R was measured in a usual d. c. circuit and with a constant magnetic field. Hole-conducting semiconductors exhibit a pronounced dependence of R upon H in weak fields. At H > 4000 Oe and -145°C and at H > 8000 Oe and at room temperature a complete saturation is attained. The saturation resistance is smaller by a factor of 1,5 than that in weak fields. The sample in question exhibited a mixed conductivity of 53 Ohm . cm. Another sample with 1,47 Ohm displayed curves which above + 50°C are practically parallel. The dependence of the temperature at which the Hall constant tends towards zero upon the magnetic field strength is

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Dependence of the Hall Constant Upon Temperature   SO7/57-58-8-3/37
and Magnetic Field Strength in p-Type Germanium

described. It is contrary to that expected from theoretical
considerations. $T_{R=0}$ varies by $7^{\circ}C$ at a field strength
variation reaching almost 20 500 Oe. A similar dependence of
$T_{R=0}$ upon H was found in all hole-conducting germanium samples.
The function of R versus T is given for a few values of the
magnetic field strength. The weaker the field, the more
rapidly the Hall-constant will increase at a temperature rise.
At H = 2200 Oe this gradient reaches 30% of that at lower
temperatures. In strong fields R is almost independent of
temperature in the whole range of impurity conduction.
Previous to the decrease of R, however, a small increase of R
is observed when the state of mixed conduction is approached in fields
not exceeding 19 300 Oe. It is absolutely impossible to
ascribe the increase of the Hall-constant at a temperature
rise to a real reduction of the number of current carriers.
As an explanation of the anomalous behaviour of p-germanium
a model with three types of carriers was advocated in reference
9: electrons, "ordinary" holes and "fast" holes. The results
obtained in this investigation can all be explained with the

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Dependence of the Hall Constant Upon Temperature   SOV/57-58-8-3/37
and Magnetic Field Strength in p-Type Germanium

help of this model. The conception of "fast" holes is at
present a mere hypothesis. Ye. Solov'yev assisted in a few
of the measurements. There are 5 figures and 17 references,
3 of which are Soviet.

ASSOCIATION: Leningradskiy fiziko-tekhnicheskiy institut AN SSSR
(Leningrad Physical and Technical Institute, AS USSR)

SUBMITTED: April 10, 1958

Card 3/3

24(6)
AUTHORS: Tuchkevich, V. M., Shmartsev, Yu. V.   SOV/57-58-12-9/15

TITLE: On the Problem Hall Coefficient Dependence on the Strength of
the Magnetic Field in p-Type Germanium (K voprosu o
zavisimosti koeffitsiyenta Kholla ot napryazhennosti magnitnogo
polya v germanii p-tipa)

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1958, Nr 12, pp 2707-2710 (USSR)

ABSTRACT: In the paper cited by reference 5 a theory of the dependence
of the Hall coefficient on the strength of the magnetic field
was laid down. In the calculations carried out there an
agreement of the theoretical calculations with experimental
data could be reached. In this instance the variation of the
mobility of light and heavy holes in an external magnetic
field was taken account of. As, however the change in
concentration could also be the reason for the dependence of
the Hall coefficient on the strength of the magnetic field;
this means a decrease in concentration of the light holes
together with an increase in concentration of the heavy holes
so that the sum of their concentrations remains constant:
$p_L + p_H$ = constant. This phenomenon may be due to a separation
of the valence zones of light and heavy holes under the action

Card 1/2

On the Problem Hall Coefficient Dependence on the   SOV/57-58-12-9/15
Strength of the Magnetic Field in p-Type Germanium

of an external magnetic field. Therefore a certain activation
energy for the formation of light holes will occur. Formula
(12) for the ratio of the concentrations of light and heavy
holes is written down. To simplify this formula the dependence
of the charge carrier motion on the magnetic field is
neglected. It can be shown that this assumption does not
change the qualitative course of the dependence of the Hall
coefficient on the strength of the magnetic field. This is
very well admissible under conditions assumed in the present
case for a rough calculation. From formula (10) (Ref 5)
formula (13) is obtained for the Hall coefficient. It is shown
that theory and experiment disagree very much. Therefore more
exact theoretical considerations concerning the choice of the
ratio between light and heavy holes μ_L^O / μ_H^O are necessary.

In order to carry out quantitative calculations and to compare
the theory with the experiment also the course taken by the
function $\Delta E\ (\mathcal{H})$ must be determined. $\mathcal{H}$ denotes the field and
ΔE – the activation energy of light holes. There are 4
Card 2/2   figures and 13 references, 1 of which is Soviet.

Leningrad Phys. Tech. Inst. AS USSR

AUTHORS: Ryvkin, S. M., Strokan, N. B.,   57-28-6-5/34
            Tuchkevich, V. M., Chelnokov, V. Ye.

TITLE: Silicon Photodiodes (Kremniyevyye fotodiody)

PERIODICAL: Zhurnal Tekhnicheskoy Fiziki, 1958, Vol. 28, Nr 6,
            pp. 1165-1168 (USSR)

ABSTRACT: In the present report the results obtained by investigating
            the possibility of utilizing silicon p-n photoelements
            for the purpose of transforming light signals into electric
            signals in the photodiode regime are described. It could be
            taken for granted from the very beginning that silicon
            photodiodes, which are of somewhat lower integral
            sensitivity, must offer some advantages compared to
            germanium photodiodes (reference 3), viz. a lower "dark
            current" and a lower degree of inertia. Further, the
            results obtained by investigating the basic properties
            of the silicon photodiodes LFTI produced in the laboratory
            are described. The sensitivity of samples to the light
            of the incandescent lamp with a color temperature of the
Card 1/3   filament of $\sim$2850°C fluctated between 5 and 7 mm/lumen

Silicon Photodiodes

(figure 1). The photodiodes have the same sensitivity along the entire illuminated surface (figure 2). The dependence of sensitivity on light intensity is linear (figure 3). The volt-ampère characteristics of the photodiodes are shown (figures 4a and 4b). Estimation of the time needed for "flying through" t_o resulted in the value

$$t_o \simeq \frac{w^2}{2D} \approx 3 \cdot 10^{-8} \text{ sec.}$$ Finally, the authors endeavored

to estimate the life of the minority carriers τ in the photodiodes investigated by studying the kinetics of the photoelectromotive valve force φ. When measuring τ, $\tau \sim 1 \cdot 10^{-6}$ sec was obtained as a result. This amount must be considered to be merely the upper limit of the τ value as it corresponds to the duration of the front amplification of the light impulses. For $\varphi \ll \frac{kT}{e}$ the relaxation curve

is an exponent with a time constant $R_e C$, in which case

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$\frac{1}{R_e} = \frac{1}{R_o} + \frac{1}{R}$. The value of the capacity, which was determined

Silicon Photodiodes

57-28-6-5/34

from $R_e C$, was found to be equal to approximately 2000 pf. This capacity value is greater than the one mentioned in the table, because it corresponds approximately to the zero-displacement on the n-p-transition. There are 5 figures, 1 table, and 7 references, 7 of which are Soviet.

ASSOCIATION: Leningradskiy fiziko-tekhnicheskiy institut, AN SSSR (Leningrad Physical-Chemical Institute, AS USSR)

SUBMITTED: January 28, 1958

1. Silicon—Photoconductivity   2. Silicon—Photosensitivity
3. Silicon—Electrical properties   4. Silicon—Electron transitions   5. Mathematics

TITLE: Photodiodes

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SOV/57-28-10-5/40

21(6)

AUTHORS: Tuchkevich, V. M., Chelnokov, V. Ye.

TITLE: **Volt-Ampere Characteristics** of Diffusion n-p Junctions in Silicon (O vol'tampernoy kharakteristike diffuzionnykh kremniyevykh n-p- perekhodov)

PERIODICAL: Zhurnal tekhnicheskoy fiziki,**Vol 28,** Nr 10, pp 2115-2123 (USSR)

ABSTRACT: This is an investigation of the current-voltage characteristics and of the temperature dependence of the photovoltage and of the photocurrent of diffusion silicon photodiodes. Similar investigations were also carried out with alloyed germanium photodiodes (which are covered by the paper cited by reference 4) by the author and coworkers. This paper starts out from the classic formula by Shockley (Shokli) (Ref 5). If an actual semiconductor diode is considered, the series resistance R_s of the thickness of the semiconductor material and of the contacts and the resistance shunting the junction in an inverse direction l_R must be taken into account. If this is done formula (1) is transformed into formula (2). The validity of this formula (2) was checked with diffusion silicon photocells in a rectifier and in

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a diode mode of operation. The photocurrent I_p (that is the short-circuit current in an ideal photocell with $R_L = 0$) was measured with a photodiode mode of operation. The voltage of open circuit V_o was measured by means of a compensation method. The function is $I_{ph} = f(V_o)$ was determined by measurement of a great number of photocells. The curves obtained for this function are composed of three linear sections. The photocurrent versus photovoltage function can be specified for the individual sections by formula (3):

$$I_{ph} = I_o (e^{\frac{qV_o}{\beta kT}} - 1),$$

where q denotes electronic charge, k the Botzmann constant, T the absolute temperature, and β a factor > 1. In each rectilinear section the values of I_o and β are different, β, which is computed from the gradient of the rectilinear sections, differing from unity. The transition from the first to the second section always takes place at a voltage of about 0,' V. that

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from the second to the third one at 0,4 ! 0,5 V. at room tem-
perature. If the intensity of illumination is further increased
the third section extends into a vertical straight. If the tem-
perature is reduced, β increases in all three sections. No
clearly defined saturation range was generally found to exist
in the backward branch of the current-voltage curve obtained
from diffusion electron-hole junctions in silicon. The back-
ward resistance of such a sample is not constant and the curve
is non-linear over its whole course. The resistance shunting
the junction in an inverse direction decreases with the rise of
the voltage applied in the reciprocal direction. The temperature
dependence of the backward current measured at -2,5 V does not
show an exponential course. The curves specifying the V_o versus

temperature function at different intensities of illumination
are presented. If this intensity is increased. the photocurrent
and V_o also increase, the whole curve shifting towards higher

values. The photocurrent versus temperature curve is given.
From these curves may be seen that the photocurrent varies as
the temperature, following a linear law with a temperature co-

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Volt-Ampere Characteristics   of Diffusion n-p Junctions in Silicon

efficient of $1 \div 5 . 10^{-5}$ A/degree, up to a certain temperature, above which the photocurrent decreases. This temperature is distinctive of different samples. The relation $\lg I_{ph} = f(V_o)$

was also investigated on alloyed junction-type germanium photo-diodes, which were prepared in the PTI. The results are de-scribed in the paper cited by reference 4. V. G. Stronin, Graduate Student (Leningrad Polytechnical Institute imeni M. I. Kalinin), assisted with the measurements. There are 15 figures, 4 tables, and 13 references, 7 of which are Soviet.

SUBMITTED: July 10, 1958

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24(0)

AUTHORS: Loytsyanskiy, L. G., Paleyev, I. I., Tuchkevich, V. M.

SOV/ -28-10-37/40

TITLE: New Periodical on Technical Physics (Novyy zhurnal po tekhnicheskoy fizike)

PERIODICAL: Zhurnal teknnicheskoy fiziki,Vol 28, Nr 10, pp 2348-2349 (USSR)

ABSTRACT: The Academy of Sciences, Belorusskaya SSR, publishes a new monthly periodical since the beginning of this year (1958). It is a journal of technical physics - "Inzhenerno-fizicheskiy zhurnal", which is destined to spread the knowledge of results of scientific physical research in practical engineering quarters. The two numbers of the periodical which have hitherto been published fully comply with this program. In Nr 1 of this periodical this article is contained: A. V. Ivanov and V. S. Yermolov present applications of operational calculus to the solution of the telegraph equations which are important for problems of mathematical physics. In Nr 2 a paper by A. V. Ivanov presents an approach to the solution of heat conduction problems by similar methods. A. I. Veynik presents a comparatively simple method of an approximative integration of heat conduction equations. P. P. Yushkov and L. I. Loginov demonstrate,

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how it is possible to achieve a considerably increased preci-
sion of the methods of numerical integration of heat conduction
equations by introducing additional nodes in the space network.
N. S. Koshlyakov presents a calculation of definite integrals
according to the method of mechanical quadratures. The greater
part of the papers in the first two numbers of the periodical
concerns problems of the hydrodynamics of heat exchange and of
combustion. In Nr 1 of the periodical novel formula obtained on
the basis of experimental experience specifying the drag of the
flow through rough tubes is recommended by G. K. Filonenko. B.
V. Kantorovich and A. P. Finyagin presented an approach to
problems of the influence of an air excess on the combustion
processes of powdered fuel and in particular on the expansion
of the combustion zone. S. A. Gol'denberg presents a number of
critical remarks on the modern theories of flame expansion in
a turbulent flow and suggests an approximation method of com-
puting the dimensions of the combustion zone. F. M. Polonskaya
(a woman) and I. V. Mel'nikov investigate the possibility of a
better approximation in a quantitative sense of the formulae
for the heat transfer from bodies of different shape to sur-
rounding gas flows by introducing the square root from the body

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surface, as a characteristic length, into the condition of similarity, A. A. Polushkin approached the same problem for the case of a problem of internal flow. The short notes by M. G. Murashko and V. P. Yablonskaya (a woman) fall to the same category of problems. These notes present information concerning problems of soil freezing and of the heat exchange in soils. The note by Yu. A. Mikhaylov is also pertinent to this field, dealing with convection drying, as well as that by V. V. Shibanovas, concerning the drag of granular layers. B. A. Grigor'yev and S. N. Fomichev present the theory of the method of determining optical coefficients of technical materials with the help of an albedometer. F. I. Fedorov deals with the problem of the reflection and the refraction of light in two-axial crystals. A. M. Samson utilizes the principle of invariants and thus finds approximation formulae for the angular distribution of the resonance radiation originating from a plane parallel slab. A. M. Kripskiy finds some rules governing the evaporation of the electrode material in light sources of spectroscopic apparatus as dependent upon the electrode shape and -material. Besides these papers, others are published in this periodical, of which N. S. Svetitskiy, Z. I. Sniepkov, I. A. Kopopel'ko,

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A New Periodical on Technical Physics   SOV/57-28-10-37/40

                L. I. Tkachov, and D. Ya. Rastskaya are the authors. The
                periodical also incorporates items of "Critical Reviews and
                Bibliography", "From Abroad", and "Chronicle".

SUBMITTED: July 10, 1958

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29758
S/194/61/000/006/033/077
D201/D302

26.2421

AUTHORS: Tuchkevich, V.M. and Chelnokov, V.Ye.

TITLE: Properties of silicon as required for its applica-
             tion in solar batteries

PERIODICAL: Referativnyy zhurnal. Avtomatika i radioelektronika,
             no. 6, 1961, 25, abstract 6 G195 (V sb. Vopr. metal-
             lurgii i fiz. poluprovodnikov, M., AN SSSR, 1959,
             8-12)

TEXT: The photo-emf of a photosensitive element increases with
the increase of the lifetime of electrons and the decrease of speci-
fic resistance and whole mobility of intrinsic silicon. The magni-
tude of series resistance R_s, due to the contact resistance of the
photo-element and the resistance of silicon, determines the shape
of the load characteristic, of the photo-element current and conse-
quently, the efficiency of the ideal converter. The load character-
istic, of the photo-element current and consequently, the efficiency

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of the ideal converter. The load characteristic is given of a
photo-element having an area of 1.5 cm^2, the efficiency of which at
a solar radiation of 60 mW/cm^2 is about 8% and at 93 mW/cm^2 reaches
9%. It may be seen from the curves with contact resistances 13-1.8
ohm that lowering the latter makes it possible to obtain nearly
ideal load lines. In accordance with theoretical calculations it
is possible to obtain for monocrystallic S_i, with concentration of
impurities about 10^{19} cm^{-3}, an efficiency, with solar illumination,
of about 22-23%. $\boxed{\text{Abstracter's note: Complete translation}}$

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24.3300

S/058/62/000/004/056/160
A058/A101

AUTHORS: Tuchkevich, V. M., Chelnokov, V. Ye.

TITLE: Silicon phototubes

PERIODICAL: Referativnyy zhurnal, Fizika, no. 4, 1962, 22, abstract 4G183 (V sb.
               "Fotoelektr. i optich. yavleniya v poluprovodnikakh". Kiev, AN USSR,
               1959, 339-344)

TEXT: Phototubes were prepared from Si with p-type conductivity and a
specific resistance of the order of several ohm/cm. P-n junctions were produced
as a result of diffusion from the gaseous phase of elements from the fifth
group of the periodic system. The authors give the characteristics of the
phototubes produced.

[Abstracter's note: Complete translation]

Card 1/1

66346
SOV/181-1-10-21/21

~~24(6)~~ 24.7600

AUTHORS: Orlova, N. S., Tuchkevich, V. M.

TITLE: Dependence of the Hall Coefficient on the Magnetic Field
              Strength in Silicon

PERIODICAL: Fizika tverdogo tela, 1959, Vol 1, Nr 10,
              pp 1631 - 1634 (USSR)

ABSTRACT: Rectangular parallelepipeds (1=10-15 mm, d=1.5-3mm, h=3 mm)
              were cut out of silicon ingots produced according to Chokh-
              ral'skiy. The afore-mentioned dependence of seven samples,
              whose ϱ- and μ-values are listed in table 1, was measured
              here (for sample Nr 1 cf. figure 1). The measuring probes were
              pressed onto the sample surface by means of springs, and
              the points of contact were coated with gallium. Measurement
              was made in a permanent magnetic field and by applying direct
              current with the help of a compensated measuring arrangement.
              The sample temperatures were measured by means of a copper-
              constantan thermocouple. Measurements have shown that the
              Hall coefficient increases linearly with rising field strength
              up to field strengths of 9 kOe. From 10-11 kOe onward, the sa-
Card 1/2   turation value is attained. This holds for 300, 136, and

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Dependence of the Hall Coefficient on the Magnetic
Field Strength in Silicon

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114°K. The course of the ratio $\dfrac{R}{R_{max}}$ for n-silicon is in
qualitative agreement with the course of the same ratio
for p-silicon. Figure 2 illustrates the relative variation
in the Hall coefficient of a p-silicon sample as dependent
on magnetic field strength at 300, 136, and 114°K. There are
2 figures, 1 table, and 10 references, 1 of which is Soviet.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN SSSR (Institute of Physics
and Technology of the AS USSR)

SUBMITTED: March 12, 1959

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S/058/62/000/003/066/092
A061/A101

/8·3Y00

AUTHORS: Romanenko, V. N., Tuchkevich, V. M.

TITLE: Production of homogeneous materials by the zone leveling method

PERIODICAL: Referativnyy zhurnal, Fizika, no. 3, 1962, 11, abstract 3E93 (Sb.
               "Vopr. metallurgii i fiz. poluprovodnikov", Moscow, AN SSSR, 1961,
               46-50)

TEXT: Using Pfann's approximation, formulae are derived that permit the
impurity distribution to be established in a bar after the N-th cycle of liquid
zone motion in counter-current zone leveling. If the segregation coefficient k
is considerably less than unity, the impurity distribution in the cases considered
[on an average uniform initial distribution of impurities (1), and introduction
of impurities into the initial zone (2)] fairly well approaches uniformity
already after the first leveling cycle. Leveling is the better the smaller k and
the greater the relative liquid zone length. A method of determining k and its
concentration dependence in zone leveling is presented.
                                               B. Sokolov

[Abstracter's note: Complete translation]

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EWT(1)/EWG(k)/BDS/EEC(b)-2   AFFTC/ASD/ESD-3   Pz-4   AT/IJP(C)

S/2927/62/000/000/0076/0083   68
65

L 11043-63

ACCESSION NR: AT3002983

AUTHOR: Alferov, Zh. I.; Trukan, M. K.; Tuchkevich, V. M.

TITLE: Investigating isothermal current-voltage characteristics of germanium p-i-n structures [Report at the All-Union Conference on Semiconductor Devices, Tashkent, 2-7 October, 1961]

SOURCE: Elektronno-dy*rochny*ye perekhody* v poluprovodnikakh. Tashkent, Izd-vo AN UzSSR, 1962, 76-83

TOPIC TAGS: germanium-rectifier characteristics, germanium rectifier heating, 2,000-a germanium rectifier, TGI1-400/16 thyratron, germanium rectifier

ABSTRACT: An extended experimental investigation of germanium power rectifiers having p-i-junction areas of 1.5 and 3 cm is described. The rectifiers were developed by Zh. I. Alferov, V. I. Stafeyev, and V. M. Tuchkevich (Izv. LETI, vol 42, 1960) for power-supply units. A cosine-wave-shape pulse with a 20-microsec plateau was chosen for determining the current-voltage characteristics to avoid overheating the rectifier during tests. A power-pulse generator was designed with a TGI1-400/16 thyratron; it could develop up to 2,000-amp current, at 0.5-10-cps repetition rate, with a 200-500-microsec pulse duration. The measurements were made at 1 cps and 300

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microsec pulse duration. Isothermal current-voltage characteristics of 8 germanium rectifiers were determined and compared with theoretical curves for p-i-metal and p-i-n structures. A special method for measuring temperature of a p-n junction during the forward-current half-cycle was developed. It is based on measuring the forward voltages and comparing it with the current-voltage characteristic. Oscillo- grams, current-voltage characteristics, and temperature-current curves are given in the article. "The authors express their gratitude to G. V. Gordeyev for a useful discussion and help in calculations and to V. I. Stafeyev for discussing the results of investigation." Orig. art. has: 10 figures and 5 formulas.

ASSOCIATION: Akad. nauk SSSR(Academy of Sciences SSSR); Akad. nauk UzSSR(Academy of Sciences UzSSR); Tashkentskiy gosuniversitet im. V. I. Lenina (Tashkent State University)

SUBMITTED: 00

SUB CODE: 00

DATE ACQ: 15May63

NO REF SOV: 002

ENCL: 00

OTHER: 001

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